

List of the Claims

Following is a list of claims currently pending.

1. (Previously Presented) A trench-type storage device comprising:
a substrate;
a trench in said substrate;
multiple conductive carbon nanotubes lining said trench; and
a trench conductor, surrounded by and in direct contact with said multiple conductive carbon nanotubes, filling said trench,
wherein said trench conductor and said substrate having a co-planar top surface.
2. (Previously Presented) A trench-type storage device comprising:
a substrate;
at least one trench in said substrate;
multiple conductive carbon nanotubes lining said at least one trench;
a trench conductor filling said at least one trench and in direct contact with said multiple conductive carbon nanotubes; and
a trench dielectric between said multiple conductive carbon nanotubes and sidewalls of said at least one trench and directly underneath and in contact with said multiple conductive carbon nanotubes.
3. (Previously Presented) The storage device in claim 1, further comprising a layer of trench dielectric on top of a bottom of said trench and between said multiple conductive carbon nanotubes and sidewalls of said trench, wherein the multiple conductive carbon nanotubes form an open cylinder structure lining said sidewalls of said trench through said layer of trench dielectric.
4. (Previously Presented) The storage device in claim 3, wherein the trench conductor comprises at least one of polysilicon, a metal, and an alloy thereof, contacting said layer of trench dielectric on top of said bottom of said trench.

5. (Previously Presented) The storage device in claim 1, characterized in that the multiple conductive carbon nanotubes and the trench conductor are disposed in the trench, and the trench conductor is carbon free.
6. (Original) The storage device in claim 1, characterized in that the substrate is free of carbon nanotube catalyst materials.
7. (Previously Presented) The storage device in claim 1, characterized in that the multiple conductive carbon nanotubes form a consistent lining along approximately the entire length of sidewalls of said trench.
8. (Previously Presented) The storage device in claim 2, characterized in that the trench-type storage device is planarized so that a top surface of the substrate is coplanar with respective top surfaces of the trench dielectric, the multiple conductive carbon nanotubes and the trench conductor.
9. (Previously Presented) The storage device in claim 1, characterized in that the multiple conductive carbon nanotubes are grown downwards into the trench.
10. (Previously Presented) The storage device in claim 1, further comprising a trench dielectric between said multiple conductive carbon nanotubes and sidewalls of said trench.
11. (Previously Presented) A trench-type storage device comprising:
a substrate;
one trench in said substrate;
conductive carbon nanotubes forming an open cylinder in lining said one trench;
and
a trench conductor filling said open cylinder of said conductive carbon nanotubes
and in direct contact with said conductive carbon nanotubes,

wherein said trench conductor and said substrate having a co-planar top surface.

12. (Previously Presented) The storage device in claim 11, wherein the trench conductor comprises at least one of polysilicon, a metal, and an alloy thereof, contacting a layer of trench dielectric on top of a bottom of said one trench.

13. (Previously Presented) The storage device in claim 11, characterized in that the conductive carbon nanotubes and the trench conductor are disposed in the trench, and the trench conductor is carbon free.

14. (Previously Presented) The storage device in claim 11, characterized in that the substrate is free of carbon nanotube catalyst materials.

15. (Previously Presented) The storage device in claim 11, characterized in that the conductive carbon nanotubes form a consistent lining along approximately the entire length of sidewalls of said trench.

16. (Previously Presented) The storage device in claim 11, characterized in that the conductive carbon nanotubes are grown downwards into the trench.

17. (Previously Presented) The storage device in claim 11, further comprising a trench dielectric between said conductive carbon nanotubes and sidewalls of said trench.

18. (Previously Presented) The storage device in claim 1, further comprising a trench dielectric layer directly underneath said multiple conductive carbon nanotubes.

19. (Previously Presented) The storage device in claim 18, wherein said trench dielectric layer lining at least a substantial portion of sidewalls of said trench and said multiple conductive carbon nanotubes lining said trench via said trench dielectric layer.

20. (Previously Presented) The storage device in claim 18, wherein said trench dielectric layer having a cylindrical shape, lined by said multiple conductive carbon nanotubes across sidewalls of said cylindrical shape, and filled by said trench conductor.